January 30, 2002

MODIS sensor Working Group (MsWG) Summary

Attendance: Bill Barnes, Stuart Biggar, Vincent Chang, Roger Drake, Wayne Esaias, Chris Moeller, Vince Salomonson, Junqiang Sun, Gary Toller, Jack Xiong, Eric Vermote, Jim Young, Zhengming Wan, Joe Esposito

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Scheduled Items

Item 1. FM1 PC bands (33, 35, 36) saturation before 315K

Algorithm

(JX) The approach is to store the gain of each band and detector in a LUT. Then use the LUT to determine b1 for the saturated PC Band 33, 35, and 36.

(BB) Using the LUT to determine b_1 will cause a small error during the 5 hours per month when the bands are saturated from OBC-BB calibration.

JX) MCST could use the ratio to B34 but if a detector becomes noisy then the ratio will not be accurate. Things should be pretty stable.

RD) Should look at Temperature over an orbit

JX) MCST has done this before and doesn't see any problems.

PFM performance

This is not a problem for PFM as all Bands saturate above 315°K.

Item 2. Time-dependent RVS approach in L1B (PFM and FM1)

JX) MCST uses BDSMF indexing for the RVS LUT. If we use time dependent interpolation as we do on PFM, then the size of the LUT will grow exceedingly large.
A better (new) approach for time dependent RVS LUTs is to save the coefficients of the quadratic fit for each BDM. This significantly reduces the size of each RVS LUT a factor of about 700.
LUTs will be updated the same way as for m1 in PFM L1B.
This approach reduces the number of calculations and LUT size. Linear interpolation will be used for the coefficients time dependence, then generate RCS at time T.

SB) Must be careful the values from the quadratic functions and the linear interpolation of coefficients are commutative.

JX) In the case of linear time dependence there is no problem. Deviation from linearity can cause errors.

Item 3. SD/SDSM calibration activities: Not Reported on This Week. Moved to next meeting.

Item 4. Influence of B5 on B26

CM) The approach is to use a single B5 source detector to correct the adjacent detector (receptor) on B26.
In the first plot (pg. 3) there is a strong correlation between B5 and except a couple of granules lying off the curve. On pg. 4 the fit is much improved by removing the Mexico and Arabian data sets.
The table on pg. 5 gives the influence coefficient for the version 1 analysis in column 2 where a lower data sample is used than in the more mature analysis given in column 3. Dry atmosphere will yield vastly different coefficient than a moist atmosphere. Surface reflectance makes no contribution to the B26 inband signal only in the case of a moist atmosphere, leaving only the B5 influence on B26.

BB) Therefore, you find a set of moist atmosphere data and get the influence coefficients.

CM) The coefficients are good over all atmospheric water level and EV surface. The plots on pg. 6 and 7 show that all detectors trend together for different data sets. The influence coefficients act like an offset. Low water vapor levels yield high, erroneous coefficients. The total precipitated water vapor level should be greater than 18mm for the coefficient analysis (see pg. 8) On pg. 9 the effect of water vapor on the coefficients is plotted. The data near 31mm is out of family.

RD) Take out the 2 endpoints and the data looks like scatter about an average.

CM) On pg. 10 the data before correction is plotted. After correction, the data (blue, mature analysis) scatters about the zero line with an RMS of roughly 0.1.

BB) Where did the data come from?

CM) We looked at 3 granules where B26 should be zero.

CM) Summary: This approach corrects striping and OOB influence on B26 to produce an image of improved quality.

BB) Images are nice, but do we have improved radiometry.

CM) There is no figure of merit to determine if radiometry is improved.

BB) Are you at the point where this work can be presented to the science team.

CM) One more round with another random granule, then this work will be ready for presentation.

BB) This seems to be a 1-2% correction with 0.1% scatter.

CM) The approach could be placed into L1A.

BB) The correct place would be while calculating dn* in L1B. This will permit including the correction during analysis of the sector data (e.g. m_1).

Around the Table

Participant: Bill Barnes – No meeting next week. The next MsWG meeting is February 13, 2002.